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Applicant:	Rebecca Lau Poole et al.
Serial No.:	09/939,813
Filed:	August 27, 2001
Group Art Unit:	2122
Title:	TOPOLOGICAL MULTI-TIER BUSINESS APPLICATION COMPOSER
Our Ref. No.:	STL9-2000-0084US1

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Applicant:	Rebecca Lau Poole et al.	Examiner:	Mary J. Steelman
Serial No.:	09/939,813	Group Art Unit:	2122
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	
Inventor: Rebecca Lau Poole et al.	Examiner: Mary J. Steelman
Serial #: 09/939,813	Group Art Unit: 2122
Filed: August 27, 2001	Appeal No.: ________
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REPLY BRIEF OF APPELLANTS

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I. INTRODUCTION

In accordance with 37 CFR §41.41, Appellants' attorney hereby submits the Reply Brief of Appellants in response to the Examiner's Answer dated October 14, 2005 received in the above-identified application.

No fee is required for filing this Reply Brief. However, the Office is authorized to charge any necessary fees or credit any overpayments to Deposit Account No. 09-0460 of IBM Corporation.

II. ARGUMENTS

In the Answer, the Examiner essentially reiterates the prior rejections, albeit using somewhat different citations to the references. In this regard, this Reply Brief of Appellants incorporates by reference herein the entirety of the previously filed Brief of the Appellants. Moreover, additional arguments are also presented below.

The Examiner's Answer again asserts that claims 1-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,208,345 to Sheard et al. (Sheard), in view of U.S.

Patent No. 6,854,107 to Green et al. (Green).

Appellants' attorney respectfully disagrees.

Appellants' independent claims 1, 9, and 17 are generally directed to developing multi-tier business applications. The computer-implemented system of claim 1 is representative, and comprises an Integrated Development Environment (IDE), executed by a computer, for creating and maintaining a multi-tier business application on a multiple tier computer network, wherein the IDE includes a Topological Multi-Tier Business Application Composer that is used by a developer to graphically create and maintain the multi-tier business application, the Composer includes a window and a palette, the palette contains graphical constructs representing tiers and components of the tiers that are used to create and maintain a graphical representation of the multi-tier business application in the window, and when creating the multi-tier business application, the developer decides on a number of tiers, identifies workstations and servers within each of the tiers, and defines processing performed by each tier and its components.

FIG. 3 of Appellants' specification best illustrates this claim:

Appellants' FIG. 3

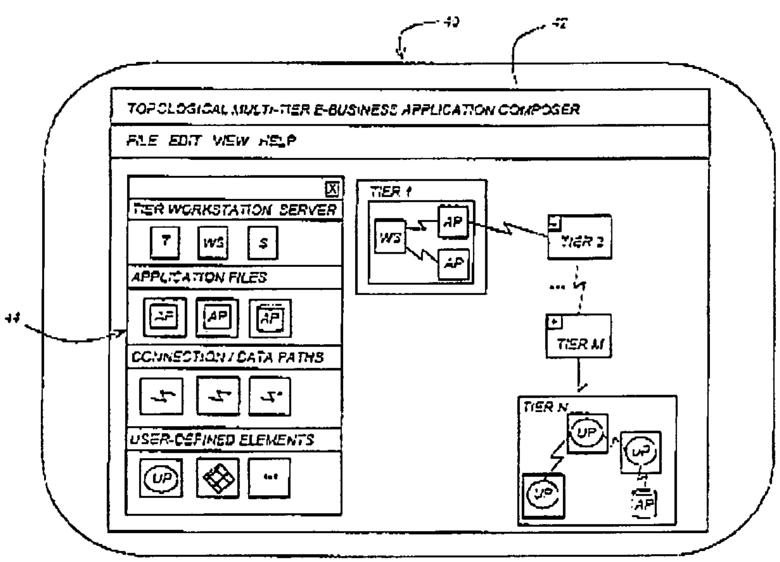


FIG. 3

The Examiner's Answer asserts that Sheard and Green together disclose all the elements of

Appellants' independent claims at the following locations: Sheard: Col. 3, lines 16-18; Fig. 17; Col. 19, line 6 - col. 20, line 8; Col. 3, lines 24-26; Fig. 19; Col. 24, lines 55-67; Col. 6, lines 11-13; Col. 22, lines 60-62; Col. 23, lines 9-15; Col. 29, lines 32-36 and 56-60; and Green: Col. 1, lines 16-21; Col. 4, lines 49-62; Fig. 1; Col. 3, lines 14-16; Fig. 5; Col. 9, lines 5-6.

These portions of Sheard and Green are set forth below:

Sheard: Col. 3, lines 16-18 and 24-26 (actually, col. 3, lines 12-44)

The present invention is directed to a visual data integration system architecture and methodology. The system architecture includes a transport framework that represents a technology-independent integration mechanism which facilitates the exchange of technology-dependent data between disparate applications. A visual interface facilitates the design, deployment, and runtime monitoring of an integrated information system implementation.

An integrated information system is developed visually through use of the visual interface by dragging and dropping component icons within a canvas area of the interface. The component icons are graphical representations of various data processing and telecommunications hardware and software elements. Various component icons may be packaged together in business extension modules to provide users with specific business integration capabilities.

Interconnections between components placed in the canvas area are graphically established using a mouse so as to define sources and destinations of specified data. An underlying configuration and runtime information framework effectively transforms the graphical interconnections into logical or physical interconnections, which results in the contemporaneous deployment of an analogous integrated runtime system. Format neutral data meta-models are employed to model the input and output data requirements of disparate systems and system components so as to remove any cross-dependencies that exist between the systems and technologies implicated in a data integration project. The use of data meta-models in this manner effectively componentizes the systems of the data integration project, thereby permitting interconnections between system components to be established and modified using visual drag-and-drop and meta-model mapping metaphores.

Sheard: Col. 6, lines 11-13 (actually, col. 6, lines 7-19)

In FIG. 1, there is illustrated a visual data integration architecture in accordance with an embodiment of the present invention. The system 30 shown in FIG. 1 provides a transport framework 33 and a visual interface 31 to facilitate the design, deployment, and runtime monitoring of an integrated information system comprising a number of disparate applications. In broad and general terms, the transport framework 33 provides a technology-independent integration mechanism that facilitates the exchange of technology-dependent data between disparate applications. The transport framework 33 enables reliable and scalable routing of information between dissimilar applications and technologies.

Sheard: Fig. 17

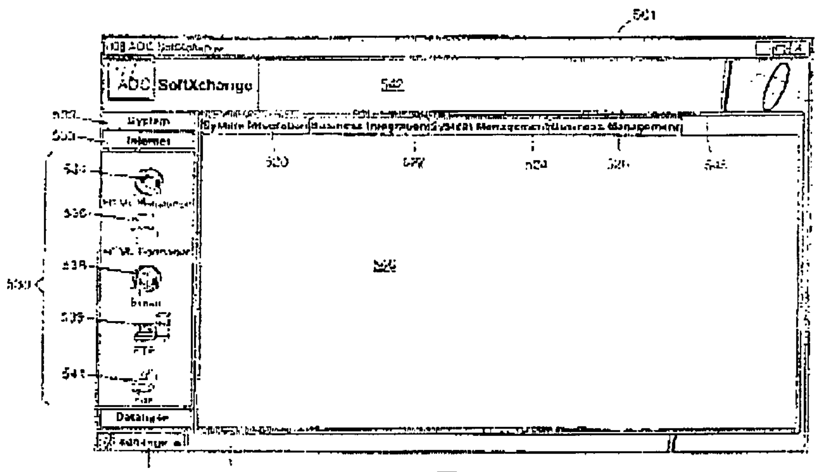


Fig. 17

Sheard: Col. 19, line 6 - col. 20, line 8 (actually, col. 20, line 15)

In accordance with the embodiment depicted in FIG. 17, the visual interface 501 includes a canvas 540 which represents the main area of the visual interface 501 where data integration deployments are constructed and managed. A system selection button 532 provides a user the ability to select between various information system deployments or projects. A business extension selection button 533 provides for user selection of any of the various business extension modules 505 that are made available to the user.

Business extension modules purchased by a user are typically loaded into the system and automatically become available when appropriately selected using the business extension selection button 533. For example, the palette 530 shown in FIG. 17 includes the set of components/adapters which are part of business extension module #1 shown in FIG. 16. As discussed previously, these components/adapters provide access to legacy applications through use of internet type technologies. Selection of business extension module #1 by the user is indicated by the "internet" status of the business extension selection button 533.

Clicking on a selected business extension module using the selection button 533 results in displaying of the constituent components/adapters associated with the selected business extension module. Each of the components or adapters constituting a given business extension module is represented in icon/button form in the palette 530. In FIG. 17, for example, contents of the Legacy-to-Internet business extension module displayed in icon form in palette 530 include adapters for HTML Response 534, HTML Formatter 536, Email 538, FTP (File Transfer Protocol) 539, and Fax 542. The palette 530 is provided with a scroll bar to access adapters that are not presently displayed in the available space of the palette 530.

The upper area 542 of the visual interface 501 contains an animated logo 543 for the data integration tool. This logo 543 becomes animated when the system is running, thereby providing an easily perceivable indication as to the status of the system. The area 545 to the left of the logo 543 is available for tool bars as are

deemed necessary or desired. A tool bar may be developed to provide a shortcut to desired primary menu items. Each button of a tool bar included within the upper area 545 generally provides pop-up tool tips associated with it.

In the bottom left corner of the visual interface 501 is an Xchange button 544. Activating the Xchange button 544 opens a pop-up menu of common system wide commands and configuration controls. A first group of menu buttons, which may be accessed via an appropriately configured tool bar or by activation of the Xchange button 544, may operate on project files, and include the following activatable buttons: new, open, save, delete, and print. A second group of buttons may include start, shutdown, pause and resume the system buttons, for example. Menu items may be disabled when their operation is not appropriate for a given context. The lower border 546 of the visual interface 501 is available for high-level status information and for help prompts that may be useful during configuration.

The canvas 540 of the visual interface 501 includes four tabs 520, 522, 524, 526 for activating four different available views of an information system layout. The four views activatable using tabs 520, 522, 524, 526 include System Integration, Business Integration, System Management, and Business Management views, respectively.

The System Integration view, which may be activated using tab 520, provides the ability using drag-and-drop techniques to visually construct and configure a data integration implementation using a palette of stock integration adapters typically packaged as part of a business extension module. FIG. 18 illustrates a data integration implementation as seen using the System Integration view. The Business Integration view, which may be activated using tab 522, allows a data integration implementation to be customized with business analysis and auditing capabilities using business orientated adapters. FIG. 20 illustrates the data integration implementation of FIG. 18 as seen using the Business Integration view.

<u>Sheard: Col. 22, lines 60-62 (actually, col. 22, line 60 - col. 23, line 9)</u>

As was discussed previously with respect to FIG. 17, the layout of a data integration project is defined within the canvas 540 of the visual interface 501. The System Integration and Business Integration views are primarily used for data integration layout. The palette 530 is populated with appropriate business extension modules and associated adapters when each of these views are activated. When using the System Integration view, the components populating the palette 503 represent adapters of a technical nature that are used to integrate the technologies and protocols of the various system elements. When using the Business Integration view, the components populating the palette 503 represent adapters directed to the auditing, processing, and analysis of business information. The adapters and components made available to the user are determined by the visual interface 501 while examining the contents of the components directory (see, e.g., FIGS. 25A-25F).

<u>Sheard: Col. 23, lines 9-15 (actually lines 10-20)</u>

In typical use, the user designs a data integration layout when the System Integration view is active by selecting various adapters and components displayed in the palette 530 of the visual interface 501. This is achieved by dragging selected adapters from the palette 530 and dropping them onto the canvas 540 using a mouse

or other input device. This operation results in the creation of a new entry for the selected adapter in the project file and, additionally, results in the creation of an instance configuration file in the projects directory using a copy of the default configuration derived from the component configuration file.

Sheard: Fig. 19

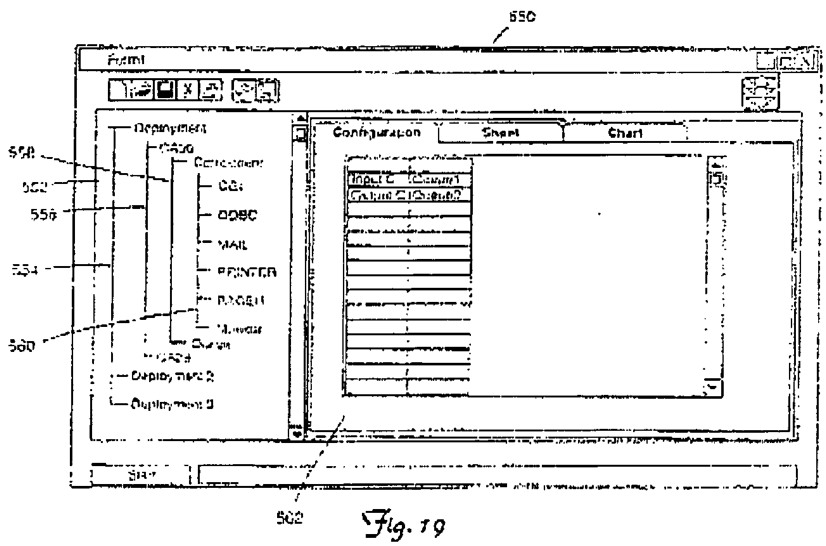


Fig. 19

Sheard: Col. 24, lines 55-67 (actually col. 24, line 51-col. 25, line 7)

The integration of data across multiple platforms and multiple workstations is coordinated through the use of a distribution planning facility. Activating the Xchange button 544 results in the presentation of a menu item which permits the user to invoke a distribution planning panel. The distribution planning panel 550, an embodiment of which is shown in FIG. 19, includes a panel 552 that provides a tree view of the network environment currently in operation for a selected data integration project. Each node in the first level 554 of the tree represents the name of a project. The second level nodes 556 under the project nodes 554 indicate the names of the workstations on which specified components are operating. A third level of nodes 558 indicates the various components operating on a particular workstation. A fourth level of nodes 560 indicates details of either component or queue elements defined on the third level of nodes 558. For example, the components shown in panel 552 of FIG. 19 includes six individual adapters, namely, CGI, ODBC, Mail, Printer, Pager, and Monitor adapters. The Monitor adapter represents a monitoring process node that is typically distinguished from other adapter nodes in terms of color or font. It is noted that the network file system mapping used to access remote machines is typically set by a system administrator outside of the visual interface environment.

Sheard: Col. 29, lines 32-36 and 56-60 (actually, col. 29, line 32 – col. 30, line 26)

As was discussed previously, a meta-model approach is used to provide a system wide specification of object and contained attribute definitions that can be used to illustrate object layout, instantiate objects, and provide for translation from one meta-defined class to another. Each adapter accepts data in a specific defined meta-model definition, manipulates the data, and produces output data in a new meta-model definition. By comparing the input and output meta-models of two interconnected adapters, it is possible to determine whether the data exchanged between the adapters is valid. Minor inconsistencies in the data requirements of two communicating adapters may be adjusted by defining mappings between the two data meta-models. Severe incompatibilities between meta-model definitions are indicative of more fundamental data issues that may require some degree of redesign to correct. The use of a meta-model approach allows the validity of a data integration implementation to be verified, errors to be highlighted, and problems to be corrected.

Storage of the meta-model is typically implemented using a file based approach which advantageously removes any dependency on a particular database technology. Each object definition is contained in a separate file in order to isolate its definition and eliminate confusion between multiple object definitions. Each meta defined class is stored in a separate file which is named using a class plus some extension convention. The contents should be displayed in as flat a structure as possible. Each attribute consists of a single line which includes its name, type, and behavioral characteristics. Each line representing an attribute may conform to the following layout:

NAME|DX_DATATYPE|REQUIREMENT|RANGE (optional)|DefaultValue (optional)

By way of further example, a sample configuration for an object class named Customer is provided below:

```
CustomerName|DX_STRING|MANDATORY|256|
Bank|DX_STRING|MANDATORY|256|"Rich's Bank"
AccountNumber|DX_INTEGER|MANDATORY|0-9999999|
Balance|DX_REAL|OPTIONAL||0
```

The following example is provided using the object class Customer defined above:

```
CustomerName|DX_STRING|MANDATORY||
AccountList|DX_LISTOBJECT|MANDATORY||
BEGIN:
    CheckingAcct|DX_COMMONOBJECT|OPTIONAL||
    BEGIN:
    AccountNumber|DX_INTEGER|MANDATORY|0-9999999|
    Balance|DX_REAL|OPTIONAL||0
    END:
    SavingsAcct|DX_COMMONOBJECT|OPTIONAL||
    BEGIN:
    AccountNumber|DX_INTEGER|MANDATORY|0-9999999|
    Balance|DX_REAL|OPTIONAL||0
    END:
```

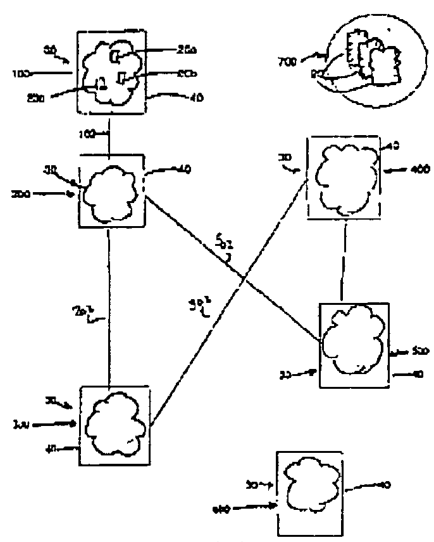
MoneyMktAcct|DX_COMMONOBJECT|OPTIONAL||.
BEGIN:
AccountNumber|DX_INTEGER|MANDATORY|0-9999999|
Balance|DX_REAL|OPTIONAL||0
END:
END:

Green: Col. 1, lines 16-21

1. Field of the Invention

The present invention relates to software design of software architectures and, in particular, to the design of a software component architecture for the development of extensible tier software component applications, including compiled, interpreted, and on-the-fly applications.

Green: Fig. 1



Green: Col. 3, lines 14-16

GUID Globally unique identifier, e.g. a number having a predetermined number of bits that uniquely identifies a software component

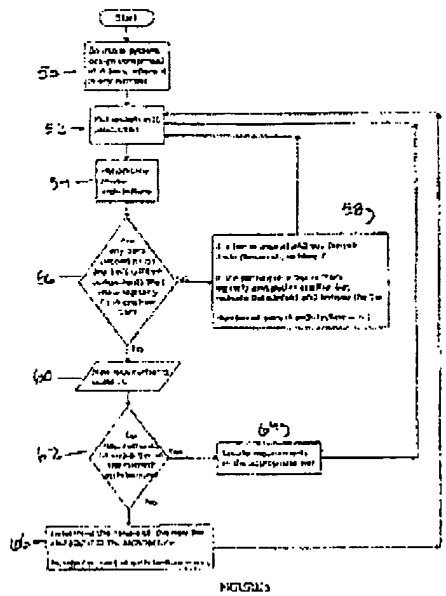
Green: Col. 4, lines 49-62

The present invention also encompasses rules to allow a given N-tier architecture to be extended, for example by adding a new tier 30 to result in a new, N+1-tier architecture. Many software components 20 developed for the predecessor N-tier architecture will be immediately reusable in the incremental, N+1-tier architecture, and others will be reusable with relatively minor modifications.

In one embodiment, the present invention provides rules to define and create a particular N-tier architecture with a specified, initial number and type of tiers 30 and with a specified interface architecture for each tier 30, where each initial tier 30

satisfies one of a major portion of system functionality, such as business logic (processing), data, and the like.

Green: Fig. 5



Green: Col. 9, lines 5-6 (actually, col. 8, line 62 - col. 9, line 6)

Referring now to FIG. 5, a life cycle flowchart, the present invention's methodology allows application development to drive changes to the present invention's architecture using a set of life cycle rules. By way of example and not limitation, rules that define a desired software architecture are either designed as described above or selected from a preexisting set of rules. Thus, a software architecture designed using the present invention's method generates software components 20, tiers 30, and applications by using software component rules 210, tier rules 310, and assembly rules 410 for an initial design 50. The initial design may have a predetermined number of initial tiers 30.

The above portions of Sheard describe a visual data integration system for visually linking data exchange components so as to visually define a data communications interface.

The palette 530 shown in FIG. 17 of Sheard merely includes a set of components and adapters that provide access to legacy applications through use of internet type technologies. In FIG. 17, for example, contents of the Legacy-to-Internet business extension module displayed in icon form in palette 530 include adapters for HTML Response 534, HTML Formatter 536, Email 538, FTP (File Transfer Protocol) 539, and Fax 542.

FIG. 19 of Sheard includes a panel 552 that provides a tree view of the network environment currently in operation for a selected data integration project. In this view, each node in

the first level 554 of the tree represents the name of a project, the second level nodes 556 under the project nodes 554 indicate the names of the workstations on which specified components are operating, a third level of nodes 558 indicates the various components operating on a particular workstation, and a fourth level of nodes 560 indicates details of either component or queue elements defined on the third level of nodes 558.

However, the palette in FIG. 17 and the tree view in FIG. 19 of Sheard do not contain graphical constructs representing tiers, and does not allow the user to use those graphical constructs to create the graphical representation of the mult-tier application, and in doing, so decide on the number of tiers in the application, or identify workstations and servers within each of the tiers.

Green is even less pertinent than Sheard. Green merely describes the design of a software component architecture for the development of extensible tier software component applications. FIG. 1 of Green is merely a diagrammatic representation of an N-tier architecture, while FIG. 5 of Green merely describes how application development drives changes to the architecture using a set of life cycle rules.

However, nothing in Green describes the use of a palette containing graphical constructs representing tiers, and nothing in Green allows the user to use such graphical constructs to create the graphical representation of a mult-tier application, or decide on the number of tiers in the application, or identify workstations and servers within each of the tiers.

Thus, even when combined, Sheard and Green do not teach or suggest a Composer that is used by a developer to graphically create and maintain a multi-tier business application, wherein the Composer includes a palette that contains graphical constructs representing tiers and components of the tiers that are used to create and maintain a graphical representation of the multi-tier business application in the window, and, when creating the multi-tier business application, the developer decides on a number of tiers, identifies workstations and servers within each of the tiers, and defines processing performed by each tier and its components.

Thus, the combination of Sheard and Green does not render obvious Appellants' claimed invention. Moreover, the various elements of Appellants' claimed invention together provide operational advantages over the combination of Sheard and Green. In addition, Appellants' invention solves problems not recognized by the combination of Sheard and Green.

Appellants' attorney submits that independent claims 1, 9, and 17 are allowable over the references. Further, dependent claims 2-8, 10-16, and 18-24 are submitted to be allowable over the references in the same manner, because they are dependent on independent claims 1, 9, and 17,

respectively, and thus contain all the limitations of the independent claims. In addition, dependent claims 2-8, 10-16, and 18-24 recite additional novel elements not shown by the references.

III. CONCLUSION

In light of the above arguments, Appellants' attorney respectfully submits that the cited references do not anticipate nor render obvious the claimed invention. More specifically, Appellants' claims recite novel physical features which patentably distinguish over any and all references under 35 U.S.C. §§ 102 and 103.

As a result, a decision by the Board of Patent Appeals and Interferences reversing the Examiner and directing allowance of the pending claims in the subject application is respectfully solicited.

Respectfully submitted,

Rebecca Lau Poole et al.

By their attorneys,

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